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THE SOCIAL & ECONOMIC IMPLICATIONS  
OF ALTERNATIVE LAND USES INVOLVING  
PASTORAL FARMING AND FORESTRY IN NORTHLAND

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in partial fulfilment of the requirements for the degree  
of Master of Philosophy in Natural Resource and Environmental Economics  
at Massey University

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## ABSTRACT

This thesis is a scenario study which examines the social and economic impacts of different types of forestry being established in an area of pastoral farmland in Northland, New Zealand.

Detailed production, income, expenditure, employment and demographic data was collected from 57 of the 59 farms in the study area. This included expenditure direction data. Those businesses and schools which supported, and were in turn supported by, the study area farms were interviewed to find out the importance of these farms to their continued operation.

This pastoral farming scenario is then compared with four forestry scenarios - two conventional forestry scenarios, plus a woodlot and finally an agroforestry scenario. In the first conventional forestry scenario all the study area farms (15,000 hectares) are planted in exotics and in the second about 3,000 hectares are planted. With the two farm forestry scenarios about 1,000 hectares are planted. In the first conventional forestry scenario forestry replaces pastoral farming, while in the second and the farm forestry scenarios pastoral farming and forestry are integrated.

Variable results resulted from the comparison, with expenditure comparisons very sensitive to the time harvesting commences, the amount cut and the time span of the scenarios. (Thirty-five years.) These comparisons were also sensitive to the locality in which farming and forestry expenditure were being compared. Forestry expenditure would be markedly higher than farming expenditure once harvesting commenced. But farming has higher backward linkage multipliers and unless forestry processing plants are established, the conventional forestry developments in the scenarios imply a relative decline in regional incomes and employment. If forestry processing plants are established, an increase in regional incomes and employment is implied. Woodlot and agroforestry generally imply an increase in expenditure and employment without the drop in agricultural spending associated with conventional forestry activities on former pastoral farmland.

Conventional forestry would result in disruption to the existing social structure. It may result in a long term population decline, but it is likely many ex-farm houses would be re-occupied. Woodlot and agroforestry would strengthen the existing social and economic structure.

It is concluded that the Northland United Council's interest and concern about the afforestation of pastoral farmland is justified. However, the rural decline, the corporatisation of government departments, plus the impacts of forestry harvesting and wood processing are considered to be of more importance in the establishment of regional planning priorities.

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Study Area Businesses: Parakao Store, Tangiteroria Store and Tangiteroria Garage.

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## ONE - INTRODUCTION

The dramatic increase in the area planted in exotic forests has been the most significant recent change in Northland's land use patterns. By 1976 23,556 hectares had been planted (Census), by 1979 40,000 hectares and by 1982, 64,000 hectares. Currently about 80,000 hectares have been planted. The 1984 annual planting rate of about 7-8,000 hectares was 'expected to continue for 10-12 years to give an exotic forest estate in excess of 150,000 hectares' (P13 Northland United Council 1984). Almost all is in large scale conventional plantings as opposed to either woodlots or agroforestry.

In 1986, while this research was being written up, the Government introduced changes to the primary sector tax system disallowing the deduction of many forestry expenses until trees are harvested. Forestry sources have stated (NZFP pers comm) that the tax law changes are the cause of the planned severe cutbacks in planting; it is too early to say whether or not forestry sector pressure to have this law changed will succeed, or what its long term effect on planting rates will be. Even if the planting rates remain at low levels a significant forest resource is in place, which has created considerable interest as to the impact of the present and anticipated increase in forestry operations on Northland's socio-economic structure.

More specifically there is interest and some concern in the impact on rural areas of forestry plantings on former pastoral farmland. For example, how will rural districts and agricultural servicing towns like Dargaville be affected by a decrease in the area of pastoral farming in their social and economic hinterland? For a number of years some have argued that planting pine trees on former or potential pastoral farmland has negative impacts, especially on existing rural communities. These negative impacts are perceived to include a decline in rural economic activity and population, plus the erosion of existing community structures. These concerns have led to conflict, often manifested in Planning Tribunal hearings and sometimes inspired by uncertainty, rather than certainty, about the anticipated impacts.

A number of previous studies on the farming/forestry issue have been carried out. Those relevant to this research include studies by Smith (1981), CNIPS (1982,1983) and Marwick (1981). The CNIPS (1982) report studied different simulated afforestation patterns in the Hawkes Bay, setting out to 'identify the social, environmental and economic costs and benefits of these contrasting patterns of afforestation. The report was concerned particularly with where and when these various costs and benefits would fall, with reference to the national economy, the regional community and the forestry industry.' (CNIPS 1983). This CNIPS (1982) study was extended to include industry and financial considerations in the CNIPS (1983) report. Among the conclusions drawn in the Hawke's Bay context, was that the benefits of locating forests on more productive land closer to ports, for a more efficient export orientated industry, were less than the benefits gained from agricultural production from the same land. That is, the benefits to the nation of locating forestry in more isolated country while continuing agricultural uses on more productive land more than offsets the extra forestry transportation costs and lower forestry productivity. In financial terms there

was 'little to choose between remote lower productivity land for afforestation and more accessible higher productivity land for afforestation, especially for lower stocking rate clearwood regimes' (p iii CNIPS 1983) This study also found that a low stocking clearwood regime greatly improved the return on all sites and had more influence than site location in determining forestry returns.

The social impacts of the simulated forestry developments varied - though rural depopulation was not seen as a likely outcome. Forestry was seen to have 'the potential to be a powerful tool for social development in rural areas, through retention or enhancement of population and services.' (p iv CNIPS1983). But it was also seen as causing conflict through changing land use in existing pastoral farming areas and to forestry workers through isolation or the distance between home and work. In existing pastoral farming areas it could lead to disruption of the existing social structure, with locals not viewing favourably the introduction of non-farming people into the community. Where forestry workers lived in isolated communities, interaction with the longer established farming community could be inhibited, with forestry workers feeling they were not fully accepted in the community. However, if forestry workers lived in urban centres, such as Hastings, the distance between work and home means that long hours would be spent travelling, which imposes strains of home life.

The two CNIPS studies, while looking at overall economic impacts, do not trace expenditure flows within the Hawkes Bay nor do they trace changes in expenditure and employment by location or sector. But the studies clearly demonstrate that there are economic and social conflicts in Hawkes Bay, from the farming/afforestation issue.

Reasons behind these negative attitudes has been studied in research on social impacts of forestry development in rural areas by Smith 1982; Makin and Smith 1982; and Smith and Wilson 1982. Other research findings suggest it would be unwise to assume all rural communities would have the same responses towards forestry development or that forestry development has the same economic implications for all communities (Marwick 1981).

Smith (1981) found that existing rural communities see large scale conventional forestry as 'a threat on four counts.'

1. Because it is usually a large-scale land-user, forestry immediately contravenes a fundamental ethic of property norms bound up in the private ownership of small land holdings. These "property" norms permeate much of New Zealand society and they are not specifically tied to either the rural or the urban setting;
2. Forestry tends to bring into a community a new category of person whose economic interests and social views are seen to conflict with those held by the established local "power elite". This latter group sees a possible undermining of their political security;



3. Forestry introduces a style and form of work that is considered to be incompatible with the local work patterns. Greater routine and a loss of autonomy are seen to characterise these new job opportunities;
4. Forestry introduces a further element of bureaucracy into rural regions. As this generally implies reduced decision-making at the local level, there is concern about the possibility of local interests being sacrificed to the whims of some externally controlled source. (Smith 1981)

Research by Marwick (1981) demonstrated that the expansion of forestry onto farmland can reverse the social and economic decline of rural communities and therefore be perceived to have positive social impacts. This research studied the impact of an expansion in forestry activity in a predominantly Maori area of Northland. The forestry development taking place included some on Maori land and in a nearby state forest. It should be stressed that the community was involved in the decisions to establish the forest and it was not a case of the state or a company simply beginning planting on land in the community without warning or consultation. Most of this area of Maori land planted was dairy farms established on tribal land, but the productivity of these farms was low and the farms hampered by large debts. The result of forestry development has been an increase in employment and the strengthening of the existing social structure's economic base, which has led to increased population, social cohesion and activity. Many of these benefits have arisen because this forestry development, (which has occurred partly as the result of community decisions) and its workforce requirements and characteristics are more aligned to Maori culture than are individual farm enterprises. These benefits would be improved if there were more opportunities for female employment. (This example should not be taken as an indication that any forestry development would be welcomed by Maori people. Indeed there is resentment towards some forestry company actions in the Far North where Maori land is planted in company trees.) This research by Marwick supports the claim that the 'contribution forestry makes depends on the specific physical, biological, economic and cultural conditions that are found' (Smith 1981) in the area. Therefore it is necessary to establish the characteristics of the community before drawing any conclusions as to the likely impact of any change in land use, be it forestry or anything else.

A number of Northlanders have expressed concern about the establishment of forestry on pastoral farmland and the findings of the different research discussed above suggest the impacts of forestry development on pastoral farmland are by no means clear cut and that Northlander's interest and concern about those impacts are understandable. This interest and concern is reflected in the Northland United Councils statement of regional planning issues and priorities (P13 Northland United Council 1984 1). Under the heading "Joint Pastoral Farming, Forestry and Horticulture Issues" the Northland United Council includes:

'The regional or sub-regional economic and social implications of current and likely future changes



in rural production' and states -

"At present significant changes in land use are taking place as a result of exotic afforestation, horticultural development, and the development or reversion of further land for pastoral farming. These, together with any changes in the mix of pastoral farming and its production per hectare, are major factors in determining the overall level and nature of rural production and employment, the demand for rural servicing, and for processing based on rural production. The annual flow of income generated by rural production affects the economy and the level of employment in the urban areas and the townships of the region. This, together with the nature and level of employment in the rural areas, affects the growth or decline of population in particular areas and hence the demand for population based services such as housing, education and health services. Extensive changes in land use may also affect the rating base of local authorities.

The impacts over the next say 10 years of the changes in the rural economy have not been evaluated. An examination of their implications would give the agencies that will have to cope with any consequent changes a basis for their own planning, and could also provide a basis for seeking changes to current trends and policies."

The research presented in this dissertation is a response to these regional planning priorities and concerns. This dissertation describes a project which attempts to quantify the social and economic consequences of major land use changes, with the research being a scenario based case study on the social and economic impacts of alternative land uses involving pastoral farming and forestry.

#### THE STUDY OBJECTIVES

- A. To analyse the social and economic impact of alternative land use scenarios involving forestry on a micro area of the Northland.
- B. To extend the findings under (A) to a larger area of Northland to indicate the impact of changes in the micro area on the surrounding region .
- C. To develop an analytical approach which can be used elsewhere to study social and economic impacts of alternative land use scenarios.

Four land use scenarios will be developed to evaluate the differential impacts of increases in forestry operations in areas of pastoral farmland, their relative impacts on production, population, employment, income and expenditure flows will be measured. The four scenarios are:

1. Pastoral farming

2. Conventional large scale forestry integrated with existing pastoral farming. (This is the form of the great majority of the exotic afforestation that has taken place in Northland over the last ten years.)
3. Farm woodlots integrated with existing pastoral farmland.
4. Agro-forestry integrated with existing pastoral forestry.

### Thesis Outline

Chapter Two presents a description of the study area, its settlements and its physical characteristics.

Chapter Three discusses the research methodology, plus the design and administration of the farm questionnaire. It concludes with comments on farm accounts.

In Chapter Four the results of the questionnaire are presented. These results give a detailed picture of the study area farms and represent the Pastoral Farming Scenario. The attitudes of the study area farmers towards forestry and the government's agricultural policy are also presented.

Chapter Five presents the large scale conventional forestry scenario, which details the size of expenditure, employment and timber production impacts the whole study area could produce if it developed as a forest. This is known as the Study Area Conventional Forestry Scenario. The results of a survey which attempted to survey forestry contractor expenditure patterns are also presented.

In Chapter Six the production, expenditure and employment impacts of the forestry scenario constructed in Chapter Four are compared with those of the study area farms. The emphasis is on presenting the differential impacts.

Chapter Seven presents the Sub Area Conventional Forestry Scenario. Here a portion of the study area is developed as a conventional forest and the impacts of this compared with the sub area farm production, income, expenditure and employment forgone. The results of the sub area scenario allow comparison with chapters 4 and 5 to see if a proportionately smaller forestry development has proportionately the same impacts.

In Chapter Eight the woodlot and agroforestry scenarios are constructed and presented.

Chapter Nine considers the multiplier implications of the farming and large scale conventional forestry scenarios. The processing implications of the large scale forestry scenarios are also discussed and the

total impact implications of the farming and forestry scenarios compared.

In Chapter Ten the total impact of all the scenarios are compared, then the summary, implications and conclusions of the research are presented.